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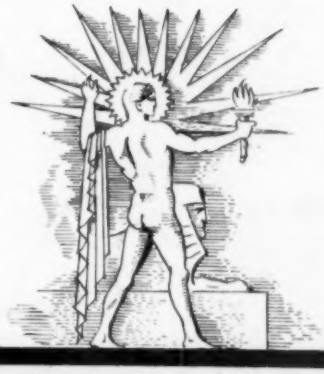
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



June 18, 1938

Tested

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A SCIENCE SERVICE PUBLICATION

Do You Know?

An international academy for advanced studies in medicine is to be established in Berlin.

Precooling potatoes before they are shipped is proving a good way of drying them, so that they do not develop soft rot.

Indian women of one Mexican tribe, the Huaxtecs, wore skirts and capes so gay that they were called "clothes of 400 colors."

Discovery of oil in Tripoli, in the course of artesian well drilling, has led Italians to a wide search for oil in that region.

Ancient Egyptian farmers kept ducks and geese, but apparently did not have chickens until Romans brought fowls about 50 B. C.

If a nail is driven into a young tree four feet from the ground, the nail will remain four feet from the ground, no matter how tall the tree grows.

Chromium is named from the Greek word *chroma*, meaning color, because chemical compounds of this metal take on green, orange, blue and other tints.

People who ask government permission to harvest cactus or haul away building stones or any other material from the public domain are told that an act of Congress is necessary to permit private exploitation of the conserved areas.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.*

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What happens if you are mad at the boss and do not say so? p. 393.

PUBLIC HEALTH

Why are custard pies a hazard to summer health? p. 396.

Fertilizers in granulated form are gaining in use.

There are slum conditions on American farms no less than in cities, farm economists point out.

Shortly before the World War, at the instigation of Germany's chief of general staff, a German industrialist built a non-rigid airship with several gondolas, and with the gas balloon divided into separated compartments.

Solid as ordinary rocks look, they can be squeezed into much smaller volume by enormous pressures.

A sea-going plow is being used in planting submarine cables in the ocean floor, where fishermen cannot drag them up.

To scare off wild ducks and other migratory birds without injuring them, grain farmers are using flash guns, revolving lights, and noise-makers.

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MEDICINE

Can Pick Infants Who Will Have Hay Fever or Asthma

Researches Toward Prevention and New Treatments of Malady Affecting Half the Families Are Reported

OVER three-fourths of the babies who are going to have hay fever or asthma when they grow older can be spotted before they are four months old, Dr. Norman Ward Clein of Seattle, told members of the Association for the Study of Allergy at their meeting in San Francisco.

Before this age three main types of symptoms develop which show that the infant is allergic and due to have hay fever, or asthma, or hives from something he eats, when he gets older. These symptoms, Dr. Clein said, are: 1. rash or eczema; 2. vomiting; 3. stomach and intestinal distress including severe colic, gas and diarrhea. Sometimes even asthma, the runny nose of hay fever or hives, develop during the babies' first few months of life.

Nearly three-fourths of the allergic infants Dr. Clein studied had parents who were allergic. Some babies were definitely sensitized or made allergic from their mothers' milk.

"Babies nursing from allergic mothers," Dr. Clein said, "have approximately five times as much chance of developing allergic symptoms as those from a non-allergic mother."

It is important to recognize the first allergic symptom, Dr. Clein pointed out, so that dietary or other measures may be taken to prevent one of the major allergic conditions from developing or at least to prevent its becoming a serious trouble.

Half the Families Affected

In very nearly one-half the families of the country there is at least one person who suffers from hay fever, asthma or some other kind of allergic disease, if figures based on a survey of a city of 35,000 population are representative of the whole nation. The survey was reported by Dr. W. C. Service of Colorado Springs, Colo.

Sampling was based on economic distribution to get a representative group of the general population of the nation. The number of families surveyed was 1,000, comprising over 3,000 individuals.

Hay fever or other allergic disease was found in 44.9 per cent. of these families, leaving just over half, 55.1 per cent., in the non-allergic group. About one-fifth, 19.68 per cent., of the individuals in the general population had some form of allergic ailment, while about four-fifths, 80.32 per cent., were non-allergic. (If you are surprised that the percentage is lower in the case of individuals than for families, get out your pencil and figure it yourself, remembering that there were over 3,000 persons in the 1,000 families.)

Hay fever led the other allergic diseases in point of frequency. Of the other allergies, a slightly greater percentage had asthma than eczema, migraine headaches, hives or gastro-intestinal allergy.

Inheritance was a factor in nearly one-third of the cases. The condition was inherited from the mother's side more than four times as often as from the father's.

X-Ray Treatment

Patients suffering with asthma that could not be relieved by other treatment have been benefitted by X-rays, Drs. C. K. Maytum and E. T. Leddy of the Mayo Clinic reported. The X-ray treatment seems to help the patient through the severe paroxysms of asthma until more specific treatment begins to take effect.

20 Gallons of Adrenalin

Imagine taking 20 gallons of adrenalin or epinephrin, the potent stuff of which hypodermic doses have revived many a failing life.

This secretion of the two little glands over the kidneys besides being used in the dramatic, life-saving episodes you read about, is the mainstay of many an asthmatic, who takes it daily over long periods in order to ease his constant struggle for breath.

The question of how much of this potent stuff can be safely taken is answered by the experience of two patients each of whom has taken a total of over 20 gallons. Reporting these cases Drs. Robert W. Lamson of Los Angeles and Harry L. Huber of Chicago said that no harmful effects that could be traced to the epinephrin were found in these patients, even in careful post-mortem examination of one of the patients.

NOW, "FUNGUS FEVER"

Spores of parasitic fungi, like the ones shown in this photomicrograph, are among the newest culprits found guilty of causing sneezes, smarting eyes, and other symptoms of hay fever. At the San Francisco meetings, O. C. Durham, chief botanist of the Abbott Laboratories, North Chicago, Ill., presented evidence for the prosecution.

In Train Operators

Having hay fever or asthma is bad enough under any conditions but having it when you are a conductor or other railroad train operator makes it even worse because moving trains stir up considerable dust and pollens and the problem is further complicated by the various types of pollens encountered in the 150 miles usually traveled on a single run.

The problem has been successfully met for employes of the Southern Pacific Railroad it appears from the report of Dr. Edward Matzger of San Francisco.

Accurate information as to the kinds of plants and the dates of pollination in the regions traveled by the railroad's allergic personnel were obtained in a special botanical study under the direc-

tion of Dr. LeRoy Abrams, professor of botany at Stanford University. With this information, the railroad's physicians were able to make accurate diagnoses and give specific treatments for each patient.

The results of this method of attacking the problem show, Dr. Matzger declared, that seasonal hay fever and asthma are preventable diseases.

Guinea Pig Studies

Hope that better methods of treating asthma may be developed appeared in the announcement by Dr. Bret Ratner of New York University College of Medicine that he had been able to induce asthma in guinea pigs.

This means that now for the first time asthma can be studied in the lower animals with dry dust antigens, which are comparable to the substances that produce asthma in humans. By this method, Dr. Ratner said, it will be possible to study various measures for the alleviation or eradication of this very frequent and incapacitating malady.

The guinea pigs were placed in a special experimental chamber containing asthma-causing dusts and after a certain period of time became sensitized to the dusts, so that at any time afterwards when they breathed these dusts, they had typical asthmatic attacks, just as a man sensitive to dust gets an asthma attack from breathing this dust.

In the early stages of becoming sensitized to dusts, many of the guinea pigs show the effects only in their noses and throats, but as sensitization goes on other organs are involved. This compares with early signs of allergy in children, Dr. Ratner pointed out, in whom repeated attacks of sneezing and so-called colds, which are actually allergic in character, later on become more widespread and these same children develop true allergy.

Deformities of Teeth

Deformities of teeth and jaws and a serious form of bronchial disease, bronchiectasis, are among the conditions now ascribed to hay fever, asthma or other allergic conditions.

The new idea of bronchiectasis being due to an allergy makes it possible not only to treat this condition successfully but even to prevent it, Drs. Samuel H. Watson and Charles S. Kibler of Tucson, Ariz., pointed out. This disease, in which one or more bronchi are dilated, is characterized by a bad breath, paroxysms of coughing and expectoration of pus and mucus.

The Tucson physicians believe that 90 per cent. of the bronchiectasis they see occurs in allergic persons and that the bronchiectasis and its accompanying sinusitis are secondary to allergic bronchitis and rhinitis—asthma and hay fever to you. If the allergic condition can be diagnosed and treated early, these doctors believe the bronchiectasis and sinusitis can be prevented.

Any dentist will tell you that mouth-breathing may pull the dental arch out of shape. Drs. T. Wingate Todd, Milton B. Cohen and B. Holly Broadbent—the latter a dentist—of Cleveland, told the allergists that marked deformity of the jaws is most often seen in children who have had active allergy of the hay fever or asthma type in very early life.

Perhaps mouth-breathing on account of the asthma or hay fever played a part. The Cleveland doctors pointed out, however, that any disturbance in the orderly progress or growth of the face can cause malformations of the jaw. Disturbances leading to such deformity may be caused by well recognized ailments but they may also be caused by mild, frequently unrecognized disorders, for example a case of hay fever so mild that it just seems as if the child were always having a slight head cold.

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PHYSICS—GEOLOGY

Lead Atoms May Yield Clues To Very Old Earth's History

Further Study of Variation of Isotopes May Show That Ordinary Type of Metal Holds Chemical History

THE METAL lead, already used in scientific estimates of the age of the earth, may also yield important clues to the earth's history back farther than ever before into the ages following the earth's birth from the sun, recent experiments at Harvard University indicate.

Studies made by Dr. Alfred O. Nier, national research fellow in the Harvard physics laboratories, indicate that atoms of the metal may hold locked within them at least a partial record of chemical and physical developments when the earth was young.

His studies concern the ordinary variety of lead. A second type of lead, derived as the end product of the decomposition of uranium, a radioactive element, has already won wide fame as a measure of the earth's age.

Essentially Dr. Nier's discovery is that the relative proportions of the isotopes of this metal, ordinary lead, vary considerably from sample to sample. Isotopes are atoms of the same element which differ in weight. Ordinary lead, for example, has four isotopes, weighing 204, 206, 207, and 208 atomic units. According to Dr. Nier's experiments, the relative abundance of these isotopes may vary as much as 15 per cent. Scientists have heretofore believed that the isotopes of lead had a certain, fixed ratio.

This peculiar isotope distribution dates back millions of years and was probably caused, the Harvard scientist believes, by the early contamination of ordinary lead in its primitive forms by the lead formed from the radioactive elements, thorium and uranium.

Further study of this variation and its significance may indicate that the ordinary lead atom carries within it a partial record of physical and chemical developments when the earth was young. They also expect to secure important new clues to the mechanism of the formation of lead ores.

Key instrument in the research is a special mass spectrometer, believed to be the most delicate "atom sifter" known to science. Not only can the apparatus detect the presence of rare isotopic forms, heretofore a fairly difficult procedure, but it can also yield the most accurate measurements ever made of the abundance of different isotopes present in an element.

Dr. Nier has also studied 16 other elements as the start of a comprehensive research program which will eventually put every one of the ninety-odd known elements through his spectrometer. His studies are also providing a check on the use of the other type of lead in the "radioactive clock" estimates of the earth's age.

Science News Letter, June 18, 1938

PSYCHIATRY

Slow Motion Pictures Permit Close Study of Epilepsy Fits

Psychiatrists Learn That Choked Anger Can Raise Blood Pressure; Child Killers Think Death Reversible

A MOVING picture attack on a ten billion dollar disease was presented at the meeting of the American Psychiatric Association in San Francisco by Dr. S. Bernard Wortis of New York University's Bellevue Medical College and Drs. Carney Landis and Hans Strauss of Columbia University, New York City.

The disease, which runs up the ten billion dollar bill, is epilepsy, the falling sickness that afflicted St. Paul and Julius Caesar and continues to afflict mankind in untold numbers. There are 500,000 epileptics in institutions in the United States today, each of them costing the state about $20,000. There are uncountered other sufferers who are cared for in their own homes.

On the screen the New York psychiatrists showed a patient jerking and writhing and shaking in a seizure of convulsions induced by metrazol, one of the drugs being used to treat the mental disorder of schizophrenia.

The picture was taken with a high speed camera so that the doctors could watch the convulsion in slow motion and observe each detail of it. This metrazol-induced convulsion in the schizophrenic patient they found corresponded closely in some of its phases to the major seizure or fit of epilepsy.

In spite of the antiquity and widespread prevalence of epilepsy, Dr. Wortis explained, doctors know very little of the mechanism of the convulsion itself. The high speed motion picture camera gives them for the first time a chance to find out just what happens during the convulsion.

Horrible as the convulsion is to the layman's eye, it is all over in about a minute. On the screen this horrible minute is drawn out to whatever length the doctors wish, so they can see which muscles contract, which relax, the order in which contractions and relaxations take place, and similar details.

Since they know which nerves govern the muscular activity they are watching, and where these nerves start in the brain, they hope to be able to locate the part of the brain that is affected in epilepsy, and then, perhaps, to work out more exact methods of treatment.

Anger Boosts Blood Pressure

If you get mad at the boss and tell him so, you will probably lose your job, but if you stay mad at him for years without boiling over at him, you are probably damaging your arteries and building up a dangerously high blood pressure.

Hostility suppressed for years like a boiling volcano which never erupts is the fundamental cause of the malignant high blood pressure for which no physical cause has ever been found, Drs. Franz Alexander and Leon J. Saul of the Institute for Psychoanalysis in Chicago reported.

The cases of two men and two women who all had this same consciously suppressed hostility and rage were cited to show how this could cause high blood pressure.

The hostility toward the boss, which all four patients felt, was not due to the boss himself but in every case to rage at having been forced by a dominating mother to lead dutiful, conventional lives which they hated. For these are not the red-faced, choleric, tempery persons whom you suspect at first glance of having high blood pressure. The four patients and others like them are gentle, generous to subordinates, conscientious, model citizens.

Measurements taken at psychoanalytic sessions showed that the blood pressure rose when the patient was found by psychiatric analysis to be at a pitch of rebellion and dropped to normal when the patient had a temporary spell of inner calm.

In this the psychiatrists see hope of preventing dangerously high blood pressure by giving psychiatric treatment early while the rises are fluctuating and not very great. In time these fluctuations, they believe, damage the arteries, narrowing the bore so that the heart must work at constantly greater pressure to drive the blood through.

Not all patients with suppressed rage at being dominated develop high blood pressure, Drs. Saul and Alexander said. Some may accept the domination and submit to it. Others may shun situations where they must be submissive, like the man who did free lance work because, as he said, he could not stand being bossed.

TAKING OFF

The Mayo Composite Aircraft is an English means of launching heavily loaded seaplanes for transoceanic service. The super-power required for take-off is provided by the lower component. At the left they are shown just before separating. Once in the air the upper portion can fly alone (center) and the lower portion returns to the base (right).

Queer Brain Waves

People who have "queer ideas" show it in their brain wave patterns as well as other more obvious ways. The queer or abnormal brain wave patterns found in persons who have "queer ideas" and others who have phobias, or who show signs of paranoia or other mental disturbances, were described by Drs. Frederic A. Gibbs and William G. Lennox and Mrs. Erna L. Gibbs of Boston.

The brain wave patterns consist of rhythmic wavy or spiked lines traced on paper. They constitute a record of the electrical impulses that accompany brain cell activity. These patterns are so characteristic of a person that the Boston scientists consider them as individualistic as a person's handwriting. On this point they stated:

"That we are dealing with a fundamental constitutional mechanism which reflects the essential working of the individual brain is suggested by the following facts. Each individual has his own pattern of electrical activity which, like his handwriting, can be distinguished from that of other individuals and which under standard conditions maintains its individuality from day to day. Furthermore, normal persons who are related have records which bear a resemblance to one another, and the records of normal identical twins are closely similar."

Brain wave patterns will, it is hoped, help solve some problems of mental disease, just as similar patterns of electrical impulses from the heart, called electrocardiagrams, are helping doctors learn more about heart diseases. Dr. and Mrs. Gibbs and Dr. Lennox reported that brain wave patterns in the widespread mental ailment, schizophrenia, are similar to those in patients with epilepsy. This is considered significant in view of the current theory that epilepsy and schizophrenia are antagonistic conditions.

Three Types Distinguished

The three main types of epilepsy, the Boston investigators reported, grand mal, petit mal, and psychomotor epilepsy, are each accompanied by a distinct pattern of brain waves having abnormal rhythm. The brain wave record of patients having psychomotor epilepsy is similar to that of patients suffering from schizophrenia and closely similar to those seen in the majority of children with psychopathic personalities, schizophrenia and certain abnormal behavior like epilepsy.

Temporary Death

When a small child kills someone he does not expect his victim to remain dead. He only intends to keep the victim from doing something the child would like to do and has not been permitted to do.

This new idea of the psychology of child killers and a differentiation between child and adolescent killers was presented by Drs. Lauretta Bender and Frank J. Curran of New York City.

Small children, these psychiatrists found from a careful study of a group of children under 16 who had been held for homicide, have no real understanding of death and are surprised to find that it is not "reversible." Because of this the psychiatrists concluded that for all practical purposes the conception of accidental death in such cases is justified.

The hardest task for the child killer is to believe in and accept the immutability of the death of his victim. Such children need a long period of intensive treatment, not for the mechanisms that led to the homicide but for the violent emotional reaction which results from it when they discover that death is not reversible.

The mechanisms in child killers are entirely different, the psychiatrists found, from those in adolescents who kill. These older children tend to follow the mechanisms seen in adult aggressive criminals.

Persons who commit sex crimes suffer from disorders of the endocrine glands, Dr. Clifford A. Wright of Los Angeles declared.

Such crimes were the offenses for which more than one-tenth of all individuals sent to state prison in California in 1935 were committed.

In almost every one of 251 cases of sexual irregularity which Dr. Wright studied an excess or deficiency of sex hormones showed that the normal balance between the various endocrine glands had been upset. Besides the sex glands, these glands include the thyroid, the pituitary, the adrenals and the parathyroid glands. Each of these influences all the others and if any one of them is diseased or disordered, the others may be thrown out of balance.

Abnormal condition of the sex glands and of some of these other glands which also influence sex activity could, Dr. Wright said, cause deviations such as homosexuality and exhibitionism.

A new approach to the problems of sex crimes is necessary, Dr. Wright believes, if there is to be a reduction in their number. He suggested the biologic approach as offering the best hope of results. This does not mean, however, that treatment of sex offenders with sex gland preparations will completely solve the problem. Such preparations, he pointed out, are at best only substitutive remedies and are not to be continued over long periods. Associated conditions must also be treated for lasting results.

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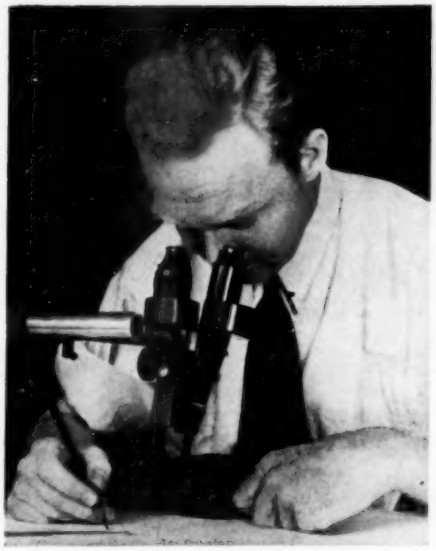
NEW PLATINUM SOURCE?

The rugged, ice-carved, wind-swept La Plata Mountains of Colorado, rising to two and a half miles above sea level, may be a source of platinum, government geologists believe, as a result of the discovery of the heavy white metal in copper ores in this region. This landscape, photographed by Edwin B. Eckel, of the U. S. Geological Survey, during the survey that found the platinum ore, is typical of the region.



FINDS U. S. PLATINUM

Edwin B. Eckel, government geologist, inspecting a polished sample of the platinum-palladium-silver-copper ore which he discovered in Colorado.

GEOLOGY

Promising Platinum Find On Colorado Public Land

DISCOVERY of "promising" amounts of platinum in the La Plata Mountains of southwestern Colorado on unclaimed public land open for location is announced by the U. S. Geological Survey. It is the first promising platinum find in the continental United States.

Found by a chemical analysis of ores collected by Edwin B. Eckel, who has been doing field work in the La Plata region for several years, the platinum metals content of some samples is as high as .54 ounces of platinum and palladium per ton. Platinum currently sells at $33 an ounce.

Geological Survey experts declined to advise on possible production and methods of working this deposit. From other sources it was learned, however, that if the ore body found is large enough, the platinum can best be mined on a by-product basis—the ore body worked for copper and the platinum metals recovered during the electrolytic refining processes. This method of recovery has already proved successful in Canada.

A possible rush of prospectors to the district, not far from the silver mines of Durango, is foreseen. The new finds warrant at least "thorough examination," the Geological Survey declares.

Occurring two miles above sea level on Copper Hill, between Bedrock and Boren Creeks, near the old town of La Plata and 21 miles northwest of Durango, the platinum-bearing veins have already produced 4,500 ounces of silver and 225,000 pounds of copper. Most of this production occurred between 1911 and 1917, when a great "glory hole" and a 600-foot tunnel were excavated.

Buried by soil and the debris from an ancient glacier, much of the ore body is hidden, and only a fraction of it, known to be 150 feet in diameter and 50 feet deep, is exposed. Further exploration by diamond drilling will show the extent of the platinum-bearing rock.

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MEDICINE—PUBLIC HEALTH

Marriage of Feebleminded Worse Than Child Marriages

A.M.A. Takes Stand on Spinach, Frowns on Rental of Radium; Overdose of Childbirth Drug Warned Against

IMAGINE a little girl of six years, who did not know the meaning of Easter or the Fourth of July, being married and having a baby, in fact having a third baby, the other two having died.

Such a case, in which the mother's mental age was six years although she was a grown woman, was described by Drs. Lloyd H. Ziegler of Wauwatosa, Wis., and Charles P. Sheldon of Boston, at the meeting of the American Medical Association in San Francisco.

The occasional marriages of 10- and 12-year-old girls are widely publicized and arouse enormous public comment, these doctors pointed out, but marriages such as they described of feebleminded adults are far more numerous and far more hazardous to society.

Nearly one-fourth of 50 unselected married patients seen in one large public hospital during four months were feebleminded, the doctors found on further study. Comparison of the indigent and self-supporting group showed that in the indigent group more than 94 babies died for every 1,000 alive, while in the self-supporting group less than half this number, about 40, died out of every 1,000 live births. The interval between births was about a year among the indigents and nearly two years among the self-supporting.

Three Measures

A combination of three measures were recommended by Drs. Ziegler and Sheldon to solve this problem of marriage and reproduction among the feeble-minded. These measures are sterilization, which although slow would help certain individuals "defend themselves from responsibilities they are ill-fitted to carry"; segregation with vocational training; and compulsory registration of persons with intelligence quotients of 70 or less. This registration information should be available to clerks and clergymen responsible for marriage licenses and to courts dealing with criminal offenders.

"If the costs of relief, dependency, delinquency and disease attributable to the feebleminded could be transferred to the ledger on the side of wise segregation and training, not only would there likely be a definite and immediate pecuniary saving, but there would also be future dividends of humanitarianism and prevention," they said.

Metrazol for Depression

Mental sickness characterized by "depressions," a serious form of mental ailment far worse than the attack of "the blues" that it sounds like, may be helped by metrazol, the drug which, like insulin, is helping shock other mentally sick patients back to sanity.

All but one out of 21 such depressed patients were helped by metrazol injections, Drs. Richard H. Young and G. Alexander Young of Omaha reported. These patients only had to stay in the hospital 21 days, much less than usual for mental sickness, and showed improvement after the first or second treatment. The average number of convulsion-inducing metrazol treatments was seven. Not enough time has elapsed, the doctors said, to be sure that the improvement in the patients will be permanent. In spite of these favorable results the doctors believe metrazol treatment should only be used as an addition to other forms of treatment.

These doctors, like many others throughout the (*Turn to Page 398*)

PHYSIOLOGY

Ragweed Pollen Extract Can Go Through Human Skin

THE ACTIVE principle of ragweed pollen—the part which causes ragweed hay fever—can be transported through the skin, it is shown by experiments reported at the meeting of the Fifteenth Colloid Symposium.

Drs. Harold A. Abramson and Manuel H. Gorin of Columbia University's College of Physicians and Surgeons described their studies of how biologically active materials can be passed through living human skin by electrical current. The problem has interest in interpreting the action of local anesthetics and the chemical known as histamine.

Living skin, report the scientists, can be considered to be a membrane dotted with fine pores. In their tests a piece of absorbent material, saturated with the active solution under study, was placed on the skin. An electrical potential was then applied so that it passed through this pad and on into the skin. Not only were ions carried into the skin by this process but the solution, as a whole, was transported through the skin.

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AERONAUTICS

Real Transatlantic Race Is Airplane vs. Liners

AIR TRAVEL is about to span the most densely traveled ocean, the North Atlantic. Whether the joint American-British service gets under way this summer or next will not alter the fact that the conquest of transoceanic skies is assured. The real race now is between airplanes and express steamers.

Such ships as the Queen Mary and the Normandie are luxury liners in more ways than one. They are expensive to run, piling up a little more deficit with every mile of their wakes. The losses are charged to national prestige of the nations whose flags they fly.

The general idea is that air transportation is always more expensive than water transport. Of particular significance therefore are the computations by experts that show that actually it will cost less to fly a passenger across the Atlantic than to carry him across on a ship like the Queen Mary. The cost per luxury liner passenger is given as $67, while with a 150-passenger plane, such as will undoubtedly be built in the next few years, the cost would be only $37. These are operating costs. The fares to be charged will be higher, including overhead and terminal charges.

Thus, not even considering the advantage of time saved, air travel will be cheaper. A moderate fleet of seaplanes would maintain daily schedules between Europe and America, and it is likely that the whole fleet would cost less than one Queen Mary or Normandie. Contrast this with the five-day crossings and weekly schedules now maintained by the deluxe express steamers.

Obviously those who go to Europe on vacation and desire to combine a pleasant sea voyage with their transportation may prefer to travel by steamer, but already many travelers of this sort are seeking the slower liners in preference to the express steamers.

The United States has not entered the international competition with extreme-sized liners, but American planes will pioneer in the Atlantic as they have to South America and across the Pacific.

Science News Letter, June 18, 1938

AERONAUTICS

Performance Figures For Famous "Hawker Hurricane"

GREAT BRITAIN'S famous "Hawker Hurricane" pursuit ship in which an English aviator flew recently from Edinburgh to London at an average speed of 408 miles an hour with a favoring wind, has a top speed in the neighborhood of 335 miles an hour.

Finally taken off the Air Ministry's secret list, the speedy craft's actual maximum speed is not known, since speed tests were not included in the trials of the prototype. Its stalling speed is 55 miles an hour and the type of wing flaps with which it is equipped give a six-to-one ratio between top speed and stalling speed.

Armed with eight Browning machine guns in the leading edge of the wing, the Hawker can climb to 15,000 feet in six minutes and has an absolute ceiling of 30,000 feet, it is claimed.

A range of two and a half hours at cruising speed is claimed for the craft. Her fighting radius is said to be 350 miles, but American experience indicates that if the range figure given is accurate, the fighting radius is likely to be only a little more than half the 350-mile figure. The Hawker's top speed is about the same as the Seversky P-35, with which the U. S. Army is now being equipped, and is considerably in excess of the best speed of the Messersmith 109, which the German air force has had for several months.

Science News Letter, June 18, 1938

IN SCIENC

PUBLIC HEALTH

Pasteurize Custard Pies For Summer Safety

IF YOU must eat custard pies, cream puffs, chocolate eclairs or other such cream-filled bakery goods in hot weather, be sure they are pasteurized. And stay away from hollandaise sauce outside your own home during the warm summer months.

This advice comes from the City Health Department of Baltimore and will probably be echoed by many other city and health authorities as summer comes on. The reason is that Baltimore and many other places in the United States have in recent years experienced outbreaks of food poisonings, chiefly during the warm months, from the consumption of bakery goods with cream or custard fillings and hollandaise sauce.

These foods which tempt your appetite are also good foods for germs of the staphylococcus family. Members of this family recently have been found guilty of causing food poisoning, the so-called ptomaine poisoning. The germs cause this illness by a toxin or poison they form in the custard filling or hollandaise sauce. You cannot taste the poison, but you can get mighty sick from eating it.

The danger of this illness from custard pies or similar pastries can be avoided, it is now known, by pasteurizing the pastry after it is filled with custard. The pasteurization, which consists of placing the pastry, after it is filled, in an oven at 425 degrees Fahrenheit and keeping it there for at least 20 minutes, kills the germs before they can produce any poison. It does not, when properly done, spoil the taste or looks of the pastry. After the pasteurization, the pastry should be cooled quickly.

Hollandaise sauce cannot be handled this way. It is spoiled by cooking and it cannot be kept in the refrigerator because chilling makes the ingredients separate into an unappetizing mess. It is good staphylococcus food and becomes dangerous if left standing in the room for any length of time. So if you are not sure of its being fresh-made just before you eat it, leave it alone.

Science News Letter, June 18, 1938

NCE FIELDS

ENGINEERING

Coiled Springs Now Damp Vibrations in Buildings

MULTIPLE coiled steel springs are now being used to damp out engine vibrations on ships and in buildings, it was reported to the Oil and Gas Power meeting of the American Society of Mechanical Engineers.

Major improvements in this long-tried method of vibration damping have now made it possible to support loads up to 900,000 pounds on coiled springs and thus isolate—from the vibration standpoint—huge machinery.

One well-known New York department store has its large Diesel power plant, in the basement, completely "floating" on 36 giant springs, each having a load capacity of 25,000 pounds, it was reported by S. Rosenzweig, engineer of The Korfund Company, Long Island City, N. Y., which made the installation.

The springs not only prevent the passage of annoying vibrations to buildings and the hulls of ships, but it has been found that the power plants show less wear and better performance, said Mr. Rosenzweig.

Science News Letter, June 18, 1938

ANTHROPOLOGY

Nerve Maladies Plagued Prehistoric Americans

DID you ever think of a prehistoric man having a nervous breakdown? Or succumbing to the jitters?

It is an idea that surprises some moderns, accustomed as we are to the platitude that nerve maladies are a sad evil of our too, too speedy civilization.

It is not easy to trace anything so elusive as mental and nervous ailments in people dead for centuries. But Dr. Juan B. Lastres, professor at the School of Medical Sciences in Lima, Peru, has rounded up a good many clues indicating that bad nerves were frequent in the prehistoric empire of the Incas. From his report to the National Museum of Peru, we may sum up these ancient causes of nerves:

Government—the high caste Incas, Indians with a genius for political organization, kept millions of Indians in South America in a sort of fascist state so complete that each Indian had to live where he was told, even wear what he was told. Strain and fear of offending political overseers was enough to produce many a nervous breakdown, Dr. Lastres believes.

War—since fighting was a major industry in Inca land, there were shattered nerves and damaged brains and all the queerness and instability that go with them.

Drug addiction—Incas knew how to deaden pain by chewing coca leaves, and the habit-forming drug cocaine may have won some victims.

Drink—a religion of formidable idols was reason enough to drive these Indians to chica or other stupefying concoctions bad for the nerves.

Inter-marriage—like Egypt's pharaohs, the Incas married sisters or other women relatives. Dr. Lastres regards this as an insidious source of hereditary degeneration in the nervous system and also the thyroid gland.

Literature—Incan legends were shockers, and Dr. Lastres condemns them as "very favorable to the development of numerous nervous ailments, chiefly functional."

Science News Letter, June 18, 1938

RADIO

Clock Is Controlled By Signals Over Radio

A RADIO clock, built either as an auxiliary or as an integral part of an otherwise ordinary radio receiver, and controlled by signals sent out from the broadcasting station along with the regular program, has been patented.

Designed by Walter van Braam Roberts of Princeton, N. J., the device as described tells time to the nearest five minutes, but can be modified to tell time to the nearest minute and second. It is covered by patent No. 2,118,109.

Controlled by a master clock at the radio station, signals are sent out at the selected interval. The signals consist of low frequency modulations, below the range audible to the human ear. Received by the receiver at the same time the regular program is coming in, the signals cause reeds to vibrate. The reeds in turn permit to pass or do not permit to pass a beam of light directed toward a screen. The position of the light beam indicates the time. The patent has been assigned to the Radio Corporation of America.

Science News Letter, June 18, 1938

INVENTION

Music Typewriter, Decimal Point Calculator Patented

A MUSIC typewriter distinguished from previous machines in that it types the staff or ruled lines as well as the notes and whose keyboard can be substituted for the keyboard of an ordinary writing machine is covered by Patent No. 2,117,363, granted to Gust Rundstatler, a Berlin inventor.

People who work out lengthy problems on slide rules and then have to stop and figure out where that all-important decimal point belongs now have, as a result of the work of Howard Gilmore of Brookline, Mass., a device which determines the decimal point's location for them. It is protected by Patent No. 2,117,413.

Science News Letter, June 18, 1938

GENERAL SCIENCE

New Carnegie Institution President Is Engineer

DR. Vannevar Bush, elected to the presidency of the Carnegie Institution of Washington to succeed Dr. John C. Merriam, who is retiring, is one of America's leading electrical engineers. For the last 15 years he has been connected with the Massachusetts Institute of Technology.

As vice-president and dean of engineering of that university, he has won world fame for his leadership in research. He built the famous differential analyzer, a mathematical robot that solves in a short time complex differential equations that would tax the patience and skill of unaided brains.

As head of the Carnegie Institution, Dr. Bush will have responsibility for one of the largest research budgets the world has seen outside of a government agency. With far-flung research activities ranging from the great 100-inch Mt. Wilson telescope in California to archaeological diggings in foreign lands, the current yearly expenditures of the Carnegie Institution are well over $1,500,000. In addition to large staffs in its permanent scientific establishments in Washington, Baltimore, Boston, Pasadena and elsewhere, dozens of investigators are given grants each year.

Dr. Bush brings to the Carnegie Institution experience from the engineering and physical sciences, whereas Dr. Merriam, present president, is a biologist and one of the world's leading students of early animal life.

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From Page 395

country, have also used both metrazol and insulin, alone and together, for patients suffering from the widespread mental disease, schizophrenia.

A tendency toward relapse from the improvement following insulin treatment for schizophrenia, makes these doctors feel that this now widely used treatment "fails to offer any special outlook for the future."

They emphasized that in spite of the striking results with insulin and metrazol, treatment of mental disease must continue along broad lines in which the patient's mental functioning and his past, present and future life situations are taken into consideration.

Takes Stand on Spinach

Spinach is good for you, the American Medical Association announced.

Recent scientific studies having tended to put spinach at least on the road to the doghouse if not actually in it, with consequent confusion in many an American home, the association's council on foods looked into the matter. They reported that:

"Spinach is a wholesome and valuable food, a rich source of vitamin A and also contributes vitamin C, iron and roughage to the diet. The evidence shows, however, that the iron in spinach is not wholly available nor is it a good source for infants in amounts they can digest. The calcium is not utilized because it is present largely in an insoluble form."

Which means that baby may have to be given iron from some other source, but that big brother and sister and papa and mama should go right on eating their spinach.

Conference on Patents

A national conference of all medical patent holders to be held at the headquarters of the association was suggested by the board of trustees as a means of settling the controversial problem of what to do about patents on medical discoveries, such as that of insulin.

At present such patents are held and administered by universities, special committees and foundations and by individual physicians. While physicians are prevented by the association's principles of ethics from deriving any income from medical discoveries, technicians or lay persons connected with the same discoveries, it was pointed out, may profit directly.

It also appears to the medical association's board of trustees that patents held under present conditions may be used to influence medical research.

Don't Rent Radium

The present widespread practice of renting radium by physicians who do not own and are not experienced in the use of this powerful substance was frowned on by the judicial council of the association. It is considered dangerous for a physician inexperienced in the use of radium to use it merely on the advice of another physician who owns a supply of radium but who has not seen the patient, or from a commercial firm owning the radium. Such a procedure, the council decided, amounts to the unethical practice of prescribing for a patient whom the prescriber has not examined.

May Damage Brain

The baby's brain may be seriously damaged by giving too large doses of pain-relieving drugs to the mother during childbirth, Dr. Frederic Schreiber of Detroit concluded from analysis of case records of 500 children with degenerative changes in their brains.

Nearly three-fourths, 72 per cent., of these children had not breathed immediately after birth or had difficulty in breathing within the first few days, Dr. Schreiber's study of the records showed. He believes that this disturbance in breathing, whatever the cause, was the reason for the damage to the child's brain.

One of the effects of the pain-relieving drugs given in childbirth, he pointed out, is to depress the breathing apparatus of the mother. This might occur to such a degree as to endanger the unborn child who is still dependent on his mother for oxygen and nourishment.

In one group of 100 cases in which a pain-killing drug or an anesthetic or both had been given to the mother, records showed that 77 babies had difficulty in breathing. The records also showed that the average dose of drugs given the mother was four times the ordinary quantity recommended and in some cases was ten times the recommended dose.

Examination after death shows that deficiency of oxygen causes microscopic changes in the brain and Dr. Schreiber believes that the difference between a living baby with a brain damaged from this cause and one born dead is probably only a matter of degree.

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ENTOMOLOGY

Government Chief Approves Insect Collecting As Hobby

ENDORSEMENT for the Science Service article on page 399, on insect collecting as a hobby and as inexpensive summer fun with lasting value, comes from the head of Uncle Sam's insect fighters, Dr. Lee A. Strong, chief of the Bureau of Entomology and Plant Quarantine of the U. S. Department of Agriculture.

Dr. Strong says:

"The hobby of making collections of insects appears to me to be a good one. Although many people recognize that insects play an important part in our welfare, few realize how many kinds there are or how widely they differ in structure and habits.

"Not all of them are pests—many are very beneficial, others are of little known importance to man. Much of the information on the occurrence of this vast number of insects has been assembled through the effort and interest of those who have studied and collected them as a hobby.

"The insects which attack crops and man's possessions cause annual losses which have been estimated as high as $3,000,000,000. Much of this can be prevented by applying control measures now known.

"With more information about insects and fuller realization of the importance of them as pests, it is fair to assume that the tribute now paid because of them will be adjusted to the favor of man and his welfare. The collection and study of them, even as a summer pastime, will contribute towards this end."

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SEISMOLOGY

Geological Society Grant For Earthquake Studies

DR. Perry Byerly, professor of seismology at the University of California, has been awarded a grant by the Geological Society of America from the Penrose bequest to study the vibration of the earth's crust during earthquakes.

Detailed measurements of the rates of vibration at all stations of the network operated by the University of California will be made during this study, to see just how fast the ground vibrates at each station during a quake.

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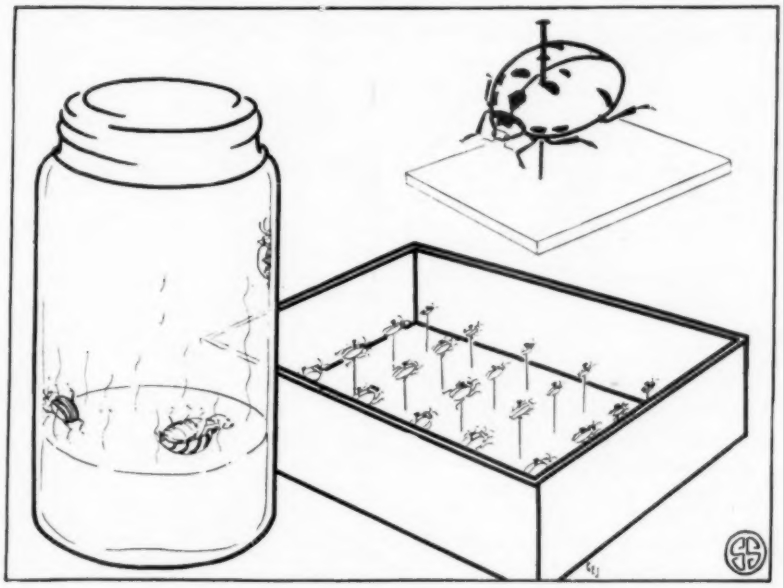
ENTOMOLOGY

Inexpensive Summer Fun

Collecting Insects Takes You Outdoors, Needs Little Cash

(First of a series of 12 articles. Next week—Collecting Wild Flowers)



WHAT YOU NEED

A pint fruit jar makes a suitable killing jar at very small expense for the necessary chemicals. You can use a cigar box as your specimen tray. When pinning the beetle, pass the pin through one of his hard wing-covers, not between them, or else there is danger that the insect will come apart.

YOU don't need to spend a lot of money to have a lot of fun cultivating a scientific hobby, at least in its beginning stages. If the collecting fever really takes hold, you'll probably empty your pocketbook on your hobby, anyway, but you can take a trial spin at it for next to nothing.

If the notion of making a collection of insects appeals to you, for example, you don't even need to buy a butterfly net. If you are handy with tools you can make one for yourself; but in some ways the beginner at "bug-hunting" may even be better off without a net.

Butterflies, for all their attractiveness, are not the best insects to begin on. They are fragile and hard to handle, and they take up a lot of room. The same may be said for dragonflies, craneflies and many other insects that require a net for their capture.

Beetles are almost an ideal group for starting-out purposes. They can be caught in the fingers as they lumber along the ground or cling to trees and bushes. They can be found by turning over sticks and stones in the woods, or by digging the bark off rotten logs with a stout knife or the point of a trowel. They don't get messy in handling, and they don't take up much room in your trays or boxes.

Several other groups of insects offer somewhat the same advantages. You might prefer to try scooping up waterbugs, or nabbing grasshoppers, katydids and crickets, or even capturing the wild cockroaches of the woods, which are quite different animals from the pests that haunt our houses.

One piece of equipment is necessary for any kind of insect collecting. This is a killing bottle. It is cruel to carry captive insects around alive, and to stick pins through them without first humanely killing them is not to be thought of. So every collector carries a wide-mouthed bottle with a tight stopper, into which he puts his insects, along with some chemical whose fumes are quickly lethal to insect life.

A common pint fruit jar makes a good killing bottle. You can have your druggist mix a little potassium cyanide (extremely poisonous stuff; look out for it!) with plaster of Paris and pour it into the bottle. Or you can cut several thicknesses of blotting paper of the right size for the jar, and onto these pour a few drops of chloroform or carbon tetrachloride.

Common pins aren't the best things for pinning out insects but they'll do all right, especially if you try to get thin ones. Don't pin your beetle exactly in the middle, between his two wing-covers, but thrust the pin through one of these hard, shell-like halves; it will hold better there.

You don't need expensive special boxes or trays for your collection. Cigar boxes will do well enough, for a start. Or if you use shallow cardboard boxes, cover the bottom with pieces of thick, soft cardboard, or of flat-surfaced corrugated paper. This makes it easier to set the pins.

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For more information

send this coupon

to Science News Letter, 2101 Constitution Avenue, Washington, D. C.

Please send me additional information about collecting insects and your list of books and leaflets on the subject.

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● Earth Trembles

Information collected by Science Service from seismological observatories and relayed to the U. S. Coast and Geodetic Survey resulted in the location of the following preliminary epicenters:

Friday, June 10, 3:15.2 a. m., Manila Time

Near Island of Buru, east of Celebes in Dutch East Indies. Latitude 4 degrees south, longitude 126 degrees east.

Friday, June 10, 6:54.3 p. m., Manila Time

Near Borodino Islands, between Philippines and Japan. Latitude 25 degrees north, longitude 132 degrees east.

For stations cooperating with Science Service in reporting earthquakes recorded on their seismographs see SNL May 21.

CHEMISTRY

American-Made Chemical Valuable to Spray Industry

BAD news for mosquitoes, flies, and other household insect pests comes from the du Point laboratories. Chemists have developed a synthetic compound that can replace a large part of the pyrethrum now imported from Asia and Europe for use in insect-killing sprays.

The new compound becomes of almost military importance, because economic and political disturbances in the lands whence pyrethrum is imported are interfering with both quantity and quality of the overseas supply.

The du Pont synthetic bears the chemical name isobutyl undecylenamide. It is a combination of derivatives of alcohol and of a vegetable oil. It is non-poisonous to human beings and other warm-blooded animals, and does not make stains.

For the manufacture of fly sprays, isobutyl undecylenamide is to be dissolved in a refined base oil at the rate of approximately half of one per cent. concentration. It will be used in combination with pyrethrum extract because such combinations are most efficient in both paralyzing power and ultimate killing power on insects.

So far as insect-killing power is concerned, the new compound is a complete replacement for pyrethrum extracts in fly sprays. However, its action is slow, and since the user of fly sprays is accustomed to seeing flies drop dead immediately upon being sprayed, it is necessary to add an agent that will give the desired quick paralyzing effect.

Only about 20 per cent. of the pyrethrin which would be necessary if used alone is required for an efficient fly spray containing the new compound.

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CHEMISTRY

Strong, Fireproof, Films Now Made From Bentonite Clay

Jelly Made From Colloidal Particles of the Clay Is Dried and Made Transparent Under Pressure

A NEW fireproof transparent film, which is potentially a rival for the familiar wrapping materials of cigarette packages and thousands of other articles, was described at the meeting of the Fifteenth Colloid Symposium at Massachusetts Institute of Technology.

The new entrant into the field of transparent wrapping films is made of a clay, known as Bentonite.

The new films, now made in the laboratory, are essentially fireproof and are indestructible up to temperatures producing red heat. They are not only very strong, tough and transparent, but they are highly resistant to water, acids, alkalis, and oils and have excellent properties of electrical resistance, it was indicated in the research report of Prof. Ernst A. Hauser of Massachusetts Institute of Technology and Miss D. S. le Beau, chemist of the Dewey and Almy Chemical Company.

Bentonite is one of the strangest materials known to man. When dry it is a powderlike material. When wet it swells to many times its original size. It is sometimes used in construction to stop leaks because it swells up when wet and plugs small holes. As the water flow is stopped the Bentonite dries out a bit, shrinks, allows more water to enter and then swells up again. This continuous, reversible swelling and shrinking provides an effective sealing mechanism in many instances.

Bentonite clays, said Prof. Hauser, contain large amounts of tiny particles of colloidal size. These can be separated from the larger particles by suspending them in water and letting the bigger particles settle out.

The tiny colloidal particles are then poured off with the water and the solution placed in an ultra-centrifuge. As it whirls around, the colloidal particles are separated into layers of uniform size.

When these collodial particles are concentrated they form strong jellies which liquefy on mechanical agitation.

Prof. Hauser and Miss le Beau make their amazing films by drying the Bentonite jelly and obtaining coherent, self-supporting, translucent films, without the use of any binder.

Under pressure these translucent films turn transparent and become very strong, yet flexible. It is possible to print on them, like paper, and their electrical resistance makes them comparable to mica.

They appear useful as wrappings for high electrical insulation and as anti-corrosive coatings. Whether they will invade the market for wrappings on cigarette packages and other articles cannot yet be predicted. A patent application has been filed on the films.

The new films not only have important applications in practical living but their scientific composition is offering an interesting study for research.

Prof. Hauser exhibited photographs showing that the tiny colloidal particles of clay form networks that interlace into chains and form large single crystals.

Oil Drops for Identification

The same phenomenon which makes colored oil films on the mud puddles in the gutter is now being used by scientists to identify specific proteins, of which many thousands of combinations can exist in nature.

In a report to the symposium, Dr. Vincent J. Schaefer of the General Electric Company's Research Laboratory described how the spreading of drops of indicator oils over thin, one-molecule

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thick, films of various proteins produces characteristic patterns.

It is at the G. E. laboratories where Dr. Irving Langmuir and Dr. Katherine Blodgett have for several years been studying the methods of producing thin films on water surfaces, which have thicknesses of a few millionths of an inch.

When drops of the oil are applied to the center of such protein films the oil spreads into patterns having geometrical form, in many cases, like a star or circle. The exact shape can be used to identify the protein.

One protein used in the research was insulin, so important to persons having diabetes. When the monomolecular layer of insulin was spread on water the oil drop assumed one pattern. When certain salts were added to the water on which the insulin was resting, chemical reactions occurred with the insulin and the oil pattern changed its shape.

Soil Classification

A new way of classifying soil types—a fundamental problem of all scientific agriculture—was reported to the meeting.

Standard practice, but one not too satisfactory, is to run soils through sieves and determine sizes of the particles, said Prof. Richard Bradfield of Cornell University.

A more important characteristic of soils, however, is their ability to carry water and air to plant roots. Thus any real, exact classification of soils should include knowledge of the pore spaces in earth. Normal field soils, reported Prof. Bradfield, have from 40 to 60 per cent. of their total volume occupied by solid materials and the rest by pore spaces containing air and water in varying amounts.

It is not only important that the total volume of pore space be known, he added, but it is also necessary to have knowledge of the size of the pores, or channels, which carry down the vital air and water.

Studies reported by Prof. Bradfield describe a new way of answering this question. A sample block of soil is saturated with water and then an additional small hydrostatic head of water pressure is applied. This additional pressure forces out some of the water already in the soil. The flow is observed at different pressures and the resulting data can be plotted in the form of curves, which have characteristic shapes for different types of soils.

ECONOMICS

Unbalanced Budget is Sweden's Instrument Against Hard Times

With Reduced Taxation and Increased Expenditure, Bad Years Show Deficit; Good Years Have Surplus

A GOVERNMENTAL budget, normally out of balance, that provides a remedy for economic depression and a guarantee of sound finance—that is a prescription offered to Washington experts by Prof. Gunnar Myrdal, Swedish economist.

Swedish experience shows that it is possible to operate public finance in such a way as to allow a very radical under-balancing of the budget. The Swedish method, cited by Prof. Myrdal, prevents economic slumps and, in fact, guarantees sound finance in the long run.

Prof. Myrdal is a young man who can speak of unbalanced budgets and great depressions with a keen wit and flashing smile, yet he combines in himself all these impressive offices: Senator in the Swedish Parliament, deputy member of the board of directors of the Bank of Sweden, member, Swedish Royal Population Commission, the Housing Commission, and the Agricultural Commission, and professor of economics and finance at the University of Stockholm.

By a perpetually unbalanced budget, he did not mean one that would constantly be in the red. The red and black should alternate with the business cycle, he explained. Depressions, he said, should be planned for not as isolated years, but in their frame of the recurring good years. Budgets should be planned, not by the year any more than by the day; they should be planned for long-time periods, the books being closed annually with a deficit or a surplus.

In the bad years it is wise, they have decided in Sweden, to spend beyond your means, decrease taxation, and deliberately to run behind and have a deficit. But this deficit is made up by planning for a surplus during the following years of boom. The deficit from one bad year is split into five parts tacked on to the budgets of succeeding years.

In bad times, taxation is lowered, but expenditures for schools, for roads, and for all the works of government are kept up and even increased. This relieves public officials from the absurd position of having to scrimp on necessary public expenditures at the same time that they are proud of spending billions otherwise.

Public works in Sweden are put on an investment budget separate from the ordinary expenses. This budget must always be in balance, but this is really just a matter of bookkeeping. Only real investments on which a return is expected may be put on this budget on a rational sinking fund basis.

If a government building is to be erected, this would go on the investment budget. But the bureau occupying the building is charged a rental, year after year, and this item is part of the regular budget.

Such public works are part of the plan of enlarged spending during depression times, but by the rental or other such scheme, they are paid for during the good times that follow.

Sweden is now having a boom. Plans are now being made for a great public works program; approval is being secured from Parliament; everything is being put in readiness so that when the unemployment ranks begin to form the machinery can be instantly set in motion.

State control of railroads and waterfalls (that means power) and the tobacco and liquor businesses provide a large field for possible public investment. Coffee and oil are now being discussed as possibly to be brought under public control.

Railroads are now planning construc-

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tion work for a ten-year period, but all actual work is being delayed until the need for work comes.

Now with incomes high, taxation is being raised to pay for the hard times of the future. When that time comes, business men will not be afraid to run the government into the red again.

Sweden's way of solving great social problems is by study in a Royal Commission. The problem of recurring depressions was tackled by a Royal Commission on Budget Structure. On this sat experts from the universities and from the administration, including five economists and five members of higher administration. Prof. Myrdal was one. The ideal of a royal commission is to reach an agreement of all members so far as is possible and to define all disagreements.

Sound finances are desired by the Socialists (now in the majority in Sweden) in order that they may put through their long-time program of social reforms; they are equally desired by the Conservatives. The principle of the unbalanced budget now meets the approval of both, Prof. Myrdal said, and the plan is in effect.

All extraordinary borrowings during the last depression are now paid back and the Swedish government operated within its budget for the fiscal year 1936-1937.

"It works," Prof. Myrdal declared.

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• Radio

Every Friday at 7:30 p. m. EDT, 6:30 p. m. EST, 5:30 p. m. CST, 4:30 p. m. MST, or 3:30 p. m. PST, Science Service cooperates with the Columbia Broadcasting System in presenting over the Columbia coast to coast network a new series of "Adventures in Science" presenting dramatizations of important scientific advances and discussions by eminent scientists.

AERONAUTICS

New Giant Air Transport Exceeds Expectation in Tests

See Front Cover

THE GIANT Douglas DC-4, America's largest air transport, scored "perfect" on its initial hour-and-a-quarter flight test in the hands of Major Carl Cover, test pilot and vice-president of the Douglas Aircraft Company, makers of the plane.

The big plane, developed as a type for America's five major air lines, carried a gross load of 53,000 pounds at takeoff. It required less than half of the 2,800-foot runway of Clover Field to get into the air.

Two months of further flight testing by its makers will now follow. Seats and special instruments for eight flight observers have been installed in the plane, on which two years and $1,700,000 have already been spent.

Prior to its flight test, the 65,000-pound giant, was successfully put through a bewildering array of novel load and "indoor flight" tests, without ever leaving its hanger, devised to guarantee that the 42-passenger plane would be able to stand strains more than three times as great as any it will meet when it goes into service on United States airlines, officials of the Douglas Aircraft Company, its builders, announced. The picture on the front cover of this week's SCIENCE NEWS LETTER shows one of these tests.

"Indoor flying," never before attempted as part of the checking of a new airplane, was provided by wind tunnel and vibration tests reproducing conditions far more severe than any it will ever meet, it was stated.

The great plane, which weighs two-and-a-half times as much as the Douglas DC-3 plane now used on almost every major airline in America, was loaded with hundreds of thousands of pounds of lead during the test.

Its tricycle landing gear, the first ever placed on a large transport, was dropped 50 times to simulate "landings" of the hardest pancake variety. Each "landing" duplicated an impact of 120,000 pounds on the main wheels and 54,000 pounds on the nose wheel. The novel landing gear will enable the plane to rest horizontally on the ground as well as land safely under less favorable wind conditions than those required for the present type of landing gear.

Harry H. Wetzel, general manager and vice-president of the company, pronounced the great craft's performance "eminently satisfactory."

A load of 175,000 pounds was placed on the wings as one part of the checking. In a final test, conditions of a "high angle of attack," such as the plane entering a climb of 2,000 feet a minute from level flight of 235 miles an hour, were duplicated.

Two special steel structures, each built from 20,000 pounds of steel, were built to reproduce forces acting on the plane's wings during flight. Cables running over pulleys exerted an upward pull while hydraulic jacks applied pressure beneath the wings as part of the tests, designed to check in advance any possibility of structural failure.

Science News Letter, June 18, 1938

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DOCUMENTATION

Scientists Can Now Publish Research Upon Microfilm

A WAY in which scholars and scientists can publish the complete record of their researches without large subsidies now often necessary was presented to the Special Libraries Association by Watson Davis, director of Science Service.

By using microfilms, which are reduced-size photographic images upon 35 mm. film, it is now practical to furnish at low cost any text, pictures or other

material available. A single microfilmed copy can be distributed at a cost no higher than it would be necessary to charge per copy if the same material were printed conventionally in a minimum practical edition of about 1,000 copies.

Microfilm also makes possible for the first time the protection of the essential records of business and government, Mr. Davis said. This is the first practical method of insuring deed books and other legal documents which, if destroyed, could not be replaced.

Mr. Davis visualized the libraries and intellectual institutions of the world cooperating to provide microfilm services that will greatly speed the communication of scientific information. Already the great bulk of the world's literature can be obtained in microfilm form upon specific order at a few cents a page.

Microfilm, upon which a conventional letter or book page is not much larger than a postage stamp, is read by optical enlargement in a special reading machine. This device is used in the office like a typewriter, but costs less.

Science News Letter, June 18, 1938

ENGINEERING

Army Blasts Military Road From Hawaiian Lava

ONLY now, that the job is done, is the U. S. Army talking about its new, strategic military road across lava-lined Kole Kole Pass on the island of Oahu, Hawaii. Although only six miles long, the road rises from 450 feet at its western end to 1635 feet at the pass and then drops to 1,063 feet at its eastern terminus. Schofield Barracks and the Naval Reservation in the Lualualei pocket are the terminals of the strip.

At Schofield Barracks is important Wheeler Field of the U. S. Army Air Corps. The post has often—and rightly—been called the hub of a spoked wheel in Hawaiian defenses. The new Kole Kole Pass Road, together with other highways recently completed, will link Schofield Barracks with the defenses of Oahu previously connecting only through vulnerable approaches.

Much of the highway was dug and blasted from lava cliffs. Three hundred thousand cubic yards of earth and rock were moved but some 30,000 cubic yards had to be handled five times, so that the figure mounts to more than 500,000 cubic yards total excavation.

At one stage, reports Col. Robert S. Thomas, who completed the job, 24 tons of explosives loosened 31,000 cubic yards of rock. But the rock hung tenaciously to the mountainside and could not be undercut for fear of starting tremendous avalanches. Thus it was removed, from the top down, by a series of terraces states Col. Thomas (*Civil Engineering*).

The road has a minimum width of 18 feet and consists of six inches of macadam base with over two inches of wearing surface of hard rock and bitumen. Lying in the severe rain belt of the Koolau mountains, where 24 inches of rain have fallen in a single day, the Kole Kole Pass Road was completed in 18 months despite severe rainfall.

Science News Letter, June 18, 1938

PSYCHOLOGY

Religious Attitudes Are Difficult To Analyze

WHAT 107 persons from the Emergency Relief Bureau think about God, the Bible, Sunday observance, censorship and the proper treatment of criminals has provided a contribution to the knowledge of the human mind. (*Science*, May 27)

Tests for these religious and social attitudes were administered by Dr. Irving Lorge, of Teachers College, Columbia University. Statistical analysis of the results showed that attitudes of this sort cannot be profitably taken apart or broken down into their basic elements in the way that a chemist can break up a compound, or an artist resolve a delicate hue into its primary colors.

When the psychologist becomes too devoted to the factor method, "psychological nonsense" is likely to result, Dr. Lorge and his assistant, N. Morrison, said in their report.

"Traits beyond the first will be inadequately identified and, hence, frequently misnamed," they declared.

Science News Letter, June 18, 1938

THE AUTOBIOGRAPHY OF GENERAL ISAAC J. WISTAR

(1827-1905)

Almost hermetically sealed for 32 years after his death, the autobiography of General Isaac J. Wistar, colorful character of a colorful period, gives the American reading public a fresh, first-hand account of the nation's roisterous makers, from the Forty-Niners to the early industrialists.

Written from his diary and contemporary notes, Wistar's opus was intended only for close kinsmen's consumption. It tells with especial frankness of the gunfights and slayings, raw deals and chicanery of the opening of the Far West. In these Wistar, though of heroic stature, is not a hero to be emulated by good little boys. His will, upon his death in 1905, prohibited publication of the autobiography for at least 5 years. In 1914, The Wistar Institute of Anatomy and Biology, which he endowed, cautiously printed 250 copies with a foreword which bound their select readers to confidence.

This new limited edition is published, turning new light on historical controversies of the Civil War period and giving naturalists one of the few eye-witness accounts of the virgin wonderland of the Northwest by a nature lover who literally blazed its trails.

Recent Reviews

"This autobiography reveals one of the most colorful characters and careers in American history."
Westchester Feature Service.

"Valuable adjunct to historical records."
Boston Sunday Post.

"A strange adventure tale interlarded with the vigorous opinions of a man who knew his own mind better than most, it relates many striking incidents."
Time.

"Easy, smooth, readable literary style."
Florida Times Union.

"Unusually colorful and frank."
The Enquirer, Cincinnati.

"The book is a fortunate combination of historical material with vivid narrative and unquenchable personality, at all times vigorous, shrewd and veracious record."
Cornelia Meigs.

Pages viii + 528. Illustrated. Cloth, 8vo.

Published December, 1937

Order through your local dealer or

THE WISTAR INSTITUTE OF ANATOMY AND BIOLOGY
Woodland Avenue and Thirty-sixth Street
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•First Glances at New Books

General Science

YEAR BOOK NO. 36, 1937—*Carnegie Institution of Washington,* 419 p., $1. paper, $1.50 cloth. The Carnegie Institution of Washington, through its many staff members and associates distributed in laboratories and field stations throughout the world, has its fingers on the pulse of practically every science. Its annual reports therefore are practically summaries of progress in all the sciences. The list of new publications issued under the auspices of the Institution during 1937 occupies 23 pages of close-set type.

Science News Letter, June 18, 1938

Medicine—Biography

THE CONQUEST OF BLINDNESS: AN AUTOBIOGRAPHICAL REVIEW OF THE LIFE AND WORK OF HENRY RANDOLPH LATIMER—Henry Randolph Latimer—*American Foundation for the Blind,* 363 p., illus., $3.25. Although blind persons and those who work with and for the blind will find greatest interest in this unusual book, it can be recommended to readers without any special interest in blindness and may well open the eyes of many a seeing person to the world of the blind and the great strides that have been made in that world in recent years.

Science News Letter, June 18, 1938

Physiology

FREE SPEECH — THE STAMMERER'S RIGHT—Mabel Farrington Gifford—*pub. by author, San Francisco, Calif.,* 150 p., $2. A manual for stammerers prepared by the State Chief of the California Department of Education's bureau for correction of speech defects and disorders. The author's own experience as a stammerer added to her educational knowledge should make the book particularly useful for those to whom it is addressed.

Science News Letter, June 18, 1938

Geography

INFLUENCE OF GEOGRAPHY ON OUR ECONOMIC LIFE—Douglas C. Ridgley and Sidney E. Ekblaw—*Gregg Pub. Co.,* 658 p., illus., $1.84. A textbook intended for use in beginning courses in economic geography.

Science News Letter, June 18, 1938

Botany

OUR FERNS, THEIR HAUNTS, HABITS AND FOLKLORE — Willard N. Clute—*Stokes,* 388 p., illus., $4. A veteran pteridologist gives us a book that should please those already interested in ferns and gain new recruits for their ranks, for this book is filled with the distillation of a long lifetime of study and at the same time is written in such charmingly discursive style that it must inevitably tempt the general reader to desire better acquaintance with the plants that can furnish so many and such attractive subjects for discussion.

Science News Letter, June 18, 1938

Physiology

STEP BY STEP IN SEX EDUCATION—Edith Hale Swift—*Macmillan,* 205 p., $2. A woman physician who has had to find answers to her own children's questions on sex writes a guide for other parents in the form of imaginary but quite probable dialogue showing how sex education can be given easily at various periods in the child's life.

Science News Letter, June 18, 1938

Home Economics

EXPERIMENTAL FOOD STUDY — Agnes Fay Morgan and Irene Sanborn Hall—*Farrar & Rinehart,* 414 p., $3. A laboratory text for students of household science which should do much to inculcate the scientific spirit in these students.

Science News Letter, June 18, 1938

Ichthyology

THE LIFE STORY OF THE FISH—Brian Curtis—*Appleton-Century,* 260 p., illus., $3. A briskly written popular account of the structures and functions of the fish's body, with sidelights on what these mean in the evolutionary history of the rest of the vertebrates, including ourselves. Excellently adapted for reference use in schools as well as for the general reader.

Science News Letter, June 18, 1938

Ornithology

A BOOK OF BIRDS—Mary Priestley—*Macmillan,* 384 p., illus., $2.50. An anthology of excerpts from a long line of authors, from Aristotle and Geoffrey Chaucer to Gilbert White and W. H. Hudson, with black-and-white illustrations done in woodcut style.

Science News Letter, June 18, 1938

Physics—Biography

ISAAC NEWTON, 1642-1727—J. W. N. Sullivan—*Macmillan,* 275 p., $2.50. This, the last book of a well-known British popular writer, interprets Newton's character on the basis of all the published Newtoniana. The picture of the man which emerges is the most life-like yet drawn, though the author was curiously blind to the psychological causes of Newton's indifference to his scientific work.

Science News Letter, June 18, 1938

Biography

EDWARD WILSON, NATURE LOVER—George Seaver—*Dutton,* 221 p., illus., $3. Edward Wilson's life was short, but it was a full life with a heroic ending, and he left much for his contemporaries and successors to admire and value. Mr. Seaver's biography leaves us with the feeling that in our time there has been one who could be called, properly and in truth, heroic.

Science News Letter, June 18, 1938

History

THE NEW INTERNATIONAL YEAR BOOK: A COMPENDIUM OF THE WORLD'S PROGRESS FOR THE YEAR 1937—Frank H. Vizetelly, ed.—*Funk & Wagnalls,* 801 p., illus., $6.25. Latest of these informative guides to the history of our times, the science articles are particularly useful for reference purposes.

Science News Letter, June 18, 1938

Conservation

THE ORGANIZATION OF NATURE PROTECTION IN THE VARIOUS COUNTRIES—G. A. Brouwer—*Amer. Comm. for International Wild Life Protection,* 112 p., 75 c. A highly useful summary, first published in Dutch in 1930. Although numerous changes have taken place since then in the field of wildlife conservation, this translation still has great value as a background statement.

Science News Letter, June 18, 1938

General Science

SOVIET SAMPLES: DIARY OF AN AMERICAN PHYSIOLOGIST—Percy M. Dawson—*Edwards Bros.,* 568 lithoprinted p., $4.25. This book will be interesting to both lay and scientific readers. The simplified spelling makes reading a little difficult at first.

Science News Letter, June 18, 1938

Medicine

FIFTY YEARS A COUNTRY DOCTOR—William N. Macartney—*Dutton,* 584 p., $3.50. An interesting tale told with the simple, colorful language of the country doctor. While the book will be best appreciated by physicians, the medically minded layman might also enjoy it.

Science News Letter, June 18, 1938

Sociology

SOCIAL PROBLEMS AND POLICIES IN SWEDEN—Bertil Ohlin, ed. — *American Acad. of Political and Social Science,* 301 p., $2. paper, $2.50 cloth. Pertinent information on one of the most successful of Europe's democracies.

Science News Letter, June 18, 1938